



Agaricales (Basidiomycota, Fungi) of Sjeverni Velebit National Park in Croatia

ZDENKO TKALČEC
ARMIN MEŠIĆ
OLEG ANTONIĆ

Laboratory of Biocoenotic Research
Ruđer Bošković Institute
Bijenička cesta 54
10000 Zagreb
Croatia

Correspondence:

Zdenko Tkalčec
Laboratory of Biocoenotic Research
Ruđer Bošković Institute
Bijenička cesta 54
10000 Zagreb
Croatia
E-mail: ztkalcec@irb.hr

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Abstract

Background and Purpose: The fungi of Croatia are poorly known. Some parts of Croatia have never been mycologically explored. The order Agaricales is no exception. As a contribution to the knowledge of Croatian mycobiota, a survey of known species of Agaricales (*sensu lato*) found in Sjeverni Velebit National Park is given. The great majority of those species has never been reported for this area.

Material and Methods: The survey includes all previously published records, as well as all identified unpublished records collected until July 2004. Basic data of the records are included for each species. All samples are identified by standard mycological methods. The material is conserved by drying and deposited in the Croatian National Fungarium (CNF).

Results: The survey comprises 98 species of Agaricales, 87 of which are reported as new to the area of Sjeverni Velebit National Park. Eight species are reported as new to Croatia.

Conclusion: According to vegetational and climatic characteristics of this area, it can be assumed that this is only a small part of Agaricales species that live in Sjeverni Velebit National Park. It is necessary to continue mycological research of this protected part of Croatian nature.

INTRODUCTION

A mong all major taxonomic groups of organisms in Croatia, Fungi are the least known (46). Some parts of Croatia have never been mycologically explored. Such level of exploration is caused by an insufficient number of mycologists who have researched the area. The order Agaricales is no exception. As a contribution to the knowledge of Croatian mycobiota, we give a survey of known species of Agaricales found in Sjeverni Velebit National Park.

Up to now, only 11 species of Agaricales have been reported for the area of Sjeverni Velebit National Park (53), as a result of research by M. Tortić between 1973 and 1975. More intensive research has been started in 1998 by Z. Tkalčec and A. Mešić, with the help of a few field collaborators.

The area of Sjeverni Velebit National Park covers 109 square kilometres (see Figure 1. for the situation of the National Park in Croatia and Velebit mountain). The altitude in the park varies from 550 to 1676 m. Main types of habitats are montane (*Fagus sylvatica*), altimontane (*Abies alba*, *Fagus sylvatica*, *Picea abies*), subalpine (*Fagus sylvatica*, *Picea abies*, *Pinus mugo*) and submediterranean (*Pinus nigra*,

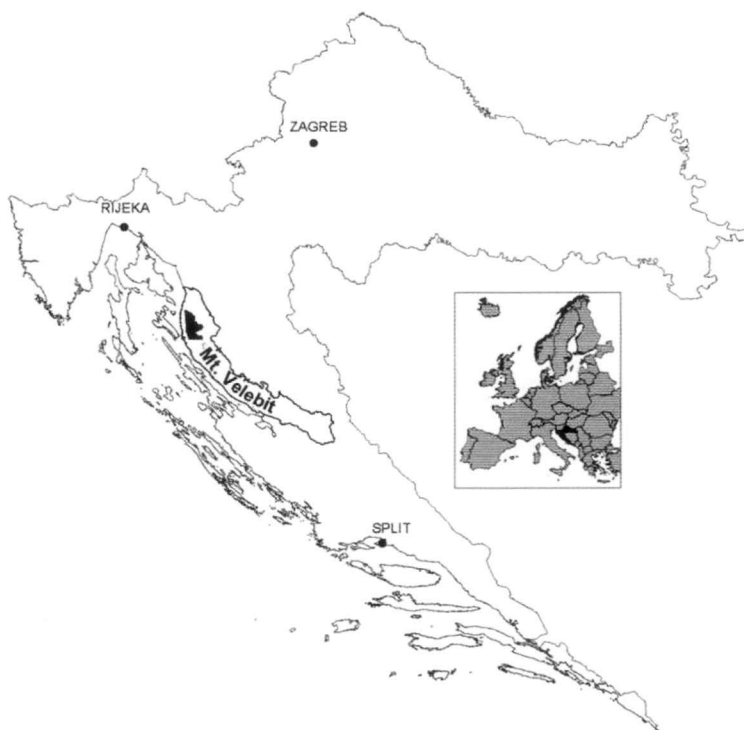


Figure 1. Geographic position of Sjeverni Velebit National Park (black area) on mountain Velebit and in the Republic of Croatia.

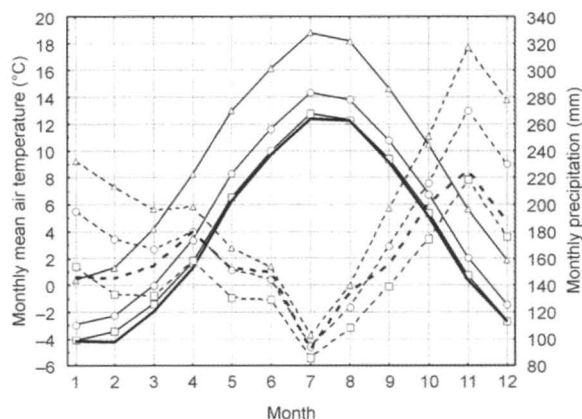


Figure 2. Macroclimatic conditions within the area of Sjeverni Velebit National Park. Solid line – monthly mean air temperature, dashed line – monthly precipitation. Triangles – maximum values expected within the area, circles – average values within the area, squares – minimum values expected within the area. Bold lines without marks represent data from Zavižan meteorological station (1956–1995).

Quercus pubescens, *Ostrya carpinifolia*) forests, with related types of vegetation succession (inland and submediterranean shrublands, grasslands and screes). Alpine vegetation above the altitudinal treeline is limited to the highest peaks and ridges. Macroclimatic data from Zavižan meteorological station (alt. 1594 m, the average annual precipitation being 1925 mm, the average annual air temperature 3.6 °C, measured between 1956

and 1995) situated in the park cannot be examined as representative for the entire National Park due to the mentioned altitudinal variability as well as the contact of two types of macroclimate (inland and mediterranean). Estimation of macroclimatic variability within the park, based on spatial interpolation macroclimatic models (2), is shown in Figure 2. Extremely rugged karst relief that developed on pure limestone geological substratum causes high spatial variability of soil and topoclimatic conditions (1). The latter is especially evident in the temperature and humidity altitudinal inversions of karst sinkholes (3).

MATERIAL AND METHODS

In this paper, we treat the order *Agaricales* in a wide sense (including *Boletales* and *Russulales*). The survey includes all previously published records, as well as all identified unpublished records collected until July 2004. Identification of specimens is based on macroscopic and/or microscopic features of basidiocarps. Microscopic features are observed with a light microscope (brightfield) with magnification up to 1,500 x. The literature on the basis of which we have identified the records is cited in brackets following the name of each species. All collected material and data are kept in the Croatian National Fungarium (CNF). Basidiocarps were preserved by drying. We quote the synonyms and misapplied names that were used in recent taxonomic literature. We cited abbreviations of fungal taxa authors according to (39).

Marks and abbreviations:

- * – species reported as new to Croatia in this paper
- – species reported as new to the area of Sjeverni Velebit National Park in this paper

A. alba – *Abies alba* Mill.

D. octopetala – *Dryas octopetala* L.

F. sylvatica – *Fagus sylvatica* L.

P. abies – *Picea abies* (L.) Karsten

P. mugo – *Pinus mugo* Turra

P. nigra – *Pinus nigra* Arnold

det. – determined by

exs. – exsiccatum

leg. – collector («legator» in Latin)

misappl. – misapplied name

The following is the list of field research dates with data on collectors and determiners.

- 1 July 1973; leg. & det. M. Tortić
- 13 Aug. 1973; leg. & det. M. Tortić
- 18 Aug. 1974; leg. & det. M. Tortić
- 22 Aug. 1974; leg. & det. M. Tortić
- 12 Aug. 1975; leg. & det. M. Tortić
- 26 Sept. 1998; leg. & det. Z. Tkalčec & A. Mešić
- Aug. 2002; leg. T. Maras, det. Z. Tkalčec & A. Mešić
- 15 Aug. 2002; leg. & det. Z. Tkalčec & A. Mešić
- 17 Aug. 2002; leg. M. Čerkez, det. Z. Tkalčec & A. Mešić
- 18 Aug. 2002; leg. M. Čerkez, det. Z. Tkalčec & A. Mešić
- Sept. 2002; leg. T. Maras, det. Z. Tkalčec & A. Mešić
- 28 Sept. 2002; leg. M. Čerkez, det. Z. Tkalčec & A. Mešić
- 16 Oct. 2002; leg. D. Šegota, det. Z. Tkalčec & A. Mešić
- 16 Oct. 2003; leg. & det. Z. Tkalčec & A. Mešić
- 6 Nov. 2003; leg. & det. Z. Tkalčec & A. Mešić
- 21 June 2004; leg. Z. Andrašević, det. Z. Tkalčec & A. Mešić
- 23 June 2004; leg. & det. Z. Tkalčec & A. Mešić

The following is the list of researched localities with basic geographic data.

Bilenski padež – SW of Bilenski padež area (near Veliki Alan saddle (1414 m)); 44°42'49"N, 14°59'57"E (r = 500 m); alt. 1300–1500 m;

Buljma – 400 m SW of peak Buljma (1451) (near Veliki Alan saddle (1414 m)); 44°42'54"N, 14°57'50"E; alt. 1260 m;

Gornja Branjevina – Northern part of Gornja Branjevina area (near Veliki Alan saddle (1414 m)); 44°42'40"N, 14°57'37"E; alt. 1050 m;

Jukinica – Jukinica area (near Lomska duliba valley); 44°46'46"N, 15°00'36"E (r = 400 m); alt. 1270–1350 m;

Lomska duliba – Between Lomska duliba valley and Zavižan mountain lodge (near the road); 44°47'39"N, 14°59'32"E (r = 1,5 km); alt. 1300–1500 m;

Mali Kozjak – 700 m NW of peak Mali Kozjak (1466) (near Veliki Lubenovac area); between 44°44'45"N, 15°02'12"E and 44°44'46"N, 15°02'20"E; alt. 1250 m;

Mali Lom – Mali Lom area (near Lomska duliba valley); 44°45'49"N, 15°03'10"E (r = 600 m); alt. 1200–1275 m;

Perišinci – Perišinci area (near Vučjak peak (1644 m)); 44°48'57"N, 14°58'53"E; alt. 1530 m;

Rossijevo sklonište 1 – 500 m N of mountain hut Rossijevo sklonište, near hiking trail Premužićeva staza; 44°46'15"N, 14°59'14"E (r = 150 m); alt. 1600 m;

Rossijevo sklonište 2 – 1 km N of Rossijevo sklonište mountain hut, near Premužićeva staza hiking trail; 44°46'50"N, 14°59'36"E (r = 300 m); alt. 1450–1600 m;

Škrbina draga 1 – Škrbina draga area (near Rožanski kukovi area); 44°46'47"N, 15°00'04"E (r = 500 m); alt. 1300–1350 m;

Škrbina draga 2 – Between Škrbina draga area and Fabin dolac area (near Rožanski kukovi area); 44°46'22"N, 14°59'48"E (r = 600 m); alt. 1325–1600 m;

Štirovača – Štirovača area; 44°41'59"N, 15°03'03"E (r = 500 m); alt. 1100–1200 m;

Velika Kosa – Near Velika Kosa peak (1622 m) (near Zavižan mountain lodge); 44°48'45"N, 14°58'22"E (r = 200 m); alt. 1600 m;

Veliki Lubenovac 1 – Veliki Lubenovac area; 44°44'23"N, 15°00'54"E (r = 100 m); alt. 1340 m;

Veliki Lubenovac 2 – N of Veliki Lubenovac valley (near the road); 44°45'13"N, 15°00'43"E (r = 600 m); alt. 1300 m;

Veliki Zavižan – 1 km SE of Veliki Zavižan peak (1676 m), near Premužićeva staza hiking trail; 44°47'48"N, 14°59'03"E (r = 600 m); alt. 1500 m;

Vučjak 1 – Near Vučjak peak (1644 m) (near Zavižan mountain lodge); 44°48'57"N, 14°58'34"E (r = 50 m); alt. 1640 m;

Vučjak 2 – 600 m S of Vučjak peak (1644 m); 44°48'38"N, 14°58'33"E; alt. 1520 m;

RESULTS AND DISCUSSION

In this paper we present 98 species of *Agaricales* from Sjeverni Velebit National Park, 87 of which are reported as new to the area. Eight species are reported as new to Croatia: *Collybia fagiphila*, *Conocybe hadrocystis*, *Cystoderma fallax*, *Entoloma catalaunicum*, *Galerina sideroides*, *Kuehneromyces lignicola*, *Psathyrella fagetophila*, *Psilocybe bohemica*.

The following is the list of all identified species with basic data on records.

- *Amanita muscaria* (L. : Fr.) Lam. (42, 43)
 - Škrbina draga 2; forest of *P. abies*: 15 Aug. 2002;
- Amanita rubescens* Pers. : Fr.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);
- *Armillaria gallica* Marxmüller et Romagn. (8, 34)
 - Misappl.: *Armillaria lutea* Gillet sensu auct. non Gillet
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Armillaria ostoyae* (Romagn.) Herink (8, 34)
 - Misappl.: *Armillaria obscura* (Schaeff.) Herink sensu auct. non Schaeff.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, exs. 1/3188;
- *Baeospora myosura* (Fr. : Fr.) Singer (34, 43)
 - Gornja Branjevina; small plantation of *P. nigra* beside a forest of *F. sylvatica*: 6 Nov. 2003, on a *P. nigra* cone;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, exs. 1/1047, 5/173;
- *Boletus edulis* Bull. : Fr. (27, 45)
 - Bilenski padež; forest of *F. sylvatica*, *P. abies*: Sept. 2002;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 15 Aug. 2002;
- *Boletus luridiformis* Rostk. (28, 45)
 - Misappl.: *Boletus erythropus* Pers. sensu auct. non Pers.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998; 16 Oct. 2003;
- Boletus luridus* Schaeff. : Fr.
 - Veliki Zavižan; forest of *F. sylvatica* and *P. abies*: 18 Aug. 1974, publ. Tortić (53);
- *Calocybe gambosa* (Fr. : Fr.) Singer ex Donk (34, 43)
 - Štirovača; grassland: 23 June 2004, exs. 1/3406;
 - Vučjak 2; pasture: 23 June 2004;
- *Chroogomphus helveticus* (Singer) Moser (51)
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 15 Aug. 2002;
- Clitocybe gibba* (Pers. : Fr.) P. Kumm.
 - Misappl.: *Clitocybe infundibuliformis* (Schaeff.) Quél. sensu auct. non Schaeff.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 12 Aug. 1975, publ. Tortić (53);
 - Vučjak 1; forest of *F. sylvatica*: 1 July 1973, publ. Tortić (53);
- *Clitocybe nebularis* (Batsch : Fr.) P. Kumm. (8, 24)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, exs. 1/1052; 16 Oct. 2002;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003;
- Clitopilus prunulus* (Scop. : Fr.) P. Kumm. (6, 43)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);
- *Collybia butyracea* (Bull. : Fr.) P. Kumm. (5)
 - Buljma; forest of *F. sylvatica*: 6 Nov. 2003;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Collybia confluens* (Pers. : Fr.) P. Kumm. (5)
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Collybia cookei* (Bres.) J.D. Arnold (5)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a rotten stump, exs. 1/3199;
- *Collybia dryophila* (Bull. : Fr.) P. Kumm. (5)
 - = *Gymnopus dryophilus* (Bull. : Fr.) Murrill
 - = *Collybia aquosa* (Bull. : Fr.) P. Kumm. var. *dryophila* (Bull. : Fr.) Krieglst.
 - Gornja Branjevina; small plantation of *P. nigra* beside a forest of *F. sylvatica*: 6 Nov. 2003;
- **Collybia fagiphila* Velen. (5)
 - = *Gymnopus fagiphilus* (Velen.) Antonín, Halling et Noordel.
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002, exs. 1/2787;
- *Collybia ocior* (Pers.) Vilgalys et O.K. Mill. (5)
 - = *Gymnopus ocior* (Pers.) Antonín et Noordel.
 - = *Collybia exculpta* (Fr.) Gillet
 - = *Collybia extuberans* (Fr.) Quél.
 - = *Collybia luteifolia* Quél.
 - = *Collybia succinea* (Fr.) Quél.
 - Buljma; forest of *F. sylvatica*: 6 Nov. 2003;
- **Conocybe hadrocystis* (Kits van Wav.) Watling (13)
 - Veliki Zavižan; forest of *P. abies* and *F. sylvatica*: 23 June 2004, on a rotten log, exs. 1/3405;
- *Coprinus comatus* (O.F. Müll. : Fr.) Pers. (21, 54)
 - Veliki Lubenovac 2; in the grass near the road: Sept. 2002;
- Coprinus micaceus* (Bull. : Fr.) Fr. (21, 54)
 - Lomska duliba; forest of *P. abies*, *A. alba*, *F. sylvatica*: 1 July 1973, beside stumps of *P. abies* and *F. sylvatica*, publ. Tortić (53);
 - Štirovača; forest of *F. sylvatica*, *P. abies*, *A. alba*: 16 Oct. 2003, on a rotten stump of *F. sylvatica*, exs. 1/3189;
 - Veliki Zavižan; forest of *F. sylvatica*: 23 June 2004, on a rotten log;
- *Cortinarius violaceus* (L. : Fr.) Gray (34, 43)
 - = *Cortinarius hercynicus* (Pers.) Moser
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Veliki Zavižan; forest of *P. abies*: 18 Aug. 2002;

- *Crepidotus applanatus* (Pers.) P. Kumm. var. *applanatus* (50)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a rotten stump, exs. 1/3198; 23 June 2004, on a rotten log, exs. 1/3411;
- *Crepidotus epibryus* (Fr. : Fr.) Quél. (50, 57)
 - = *Pleurotellus hypnophilus* (Pers.) Fayod
 - Buljma; forest of *F. sylvatica*: 6 Nov. 2003, on fallen leaves of *F. sylvatica*, exs. 1/3236;
- *Cystoderma carcharias* (Pers.) Fayod (43, 55)
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Mali Lom; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003;
- **Cystoderma fallax* A.H. Sm. et Singer (43, 55)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002, exs. 1/2780;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- **Entoloma catalaunicum* (Singer) Noordel. (44)
 - Velika Kosa; pasture: 17 Aug. 2002, exs. 1/2688;
- *Entoloma hirtipes* (Schumach. : Fr.) Moser (44)
 - Veliki Zavižan; forest of *P. abies*: 23 June 2004, exs. 1/3404;
- *Entoloma incanum* (Fr. : Fr.) Hesler (44)
 - Rossijevo sklonište 2; alpine vegetation on rocks with *D. octopetala*: 18 Aug. 2002;
- *Galerina marginata* (Batsch) Kühner (13, 58)
 - = *Galerina autumnalis* Peck
 - = *Galerina unicolor* (Vahl : Fr.) Singer
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003, on stump;
- **Galerina sideroides* (Bull.) Kühner (13, 33)
 - = *Galerina stylifera* (G.F. Atk.) A.H. Sm. et Singer
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on litter and twigs, exs. 1/3204;
- *Gymnopilus sapineus* (Fr. : Fr.) Maire (37, 43, 58)
 - = *Gymnopilus hybridus* (Fr.) Maire
 - = *Gymnopilus penetrans* (Fr.) Murrill
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on fallen branches of *P. abies* or/and *A. alba*, exs. 1/3201;
- *Hebeloma sinapizans* (Paulet ex Fr.) Gillet (34, 43)
 - Škrbina draga 2; forest of *P. abies*: 15 Aug. 2002;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Hygrocybe conica* (Schaeff. : Fr.) P. Kumm. (7, 11, 19)
 - = *Hygrocybe conica* (Schaeff. : Fr.) P. Kumm. var. *chloroides* (Malençon) Bon
 - = *Hygrocybe cinereifolia* Courtec. et Priou
 - = *Hygrocybe conicoides* (P.D. Orton) P.D. Orton et Watling
 - = *Hygrocybe conicopalustris* (R. Haller Aar.) R. Haller Aar.
 - = *Hygrocybe olivaceonigra* (P.D. Orton) Moser
 - = *Hygrocybe riparia* Kreisel
 - = *Hygrocybe tristis* (Pers.) F.H. Möller
 - = *Hygrocybe veselskyi* Singer et Kuthan

Misappl.: *Hygrocybe nigrescens* (Quél.) Kühner sensu auct. non Quél.

 - Rossijevo sklonište 2; alpine vegetation on rocks with *D. octopetala*: 18 Aug. 2002;
- *Hygrophoropsis aurantiaca* (Jacq. : Fr.) Maire (8, 43)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, on rotten stumps and logs, exs. 1/1048, 1/1049, 5/174, 5/176; 16 Oct. 2003, on rotten stumps and logs; – old sawdust beside a forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, exs. 1/3191;
- *Hygrophorus agathosmus* (Fr.) Fr. (19)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- *Hygrophorus discoideus* (Pers. : Fr.) Fr. (19)
 - Škrbina draga 1; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- *Hygrophorus eburneus* (Bull. : Fr.) Fr. (7)
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Mali Lom; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Rossijevo sklonište 1; subalpine elfin forest with *F. sylvatica*, *P. mugo*, *Salix* sp.: 28 Sept. 2002;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Velika Kosa; forest of *F. sylvatica*: 17 Aug. 2002;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Hygrophorus pudorinus* (Fr. : Fr.) Fr. (19)
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2002;
- *Hypholoma capnoides* (Fr. : Fr.) P. Kumm. (9)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;

- Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on stumps;
- Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003;
- *Hypholoma fasciculare* (Huds. : Fr.) P. Kumm. (9)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on stumps, exs. 1/3202; 23 June 2004, on a stump;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Hypholoma lateritium* (Schaeff. : Fr.) J. Schröt. (9)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Hypholoma marginatum* (Pers.) J. Schröt. (9)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a rotten stump;
- **Kuehneromyces lignicola* (Peck) Redhead (18, 38)
 - = *Pholiota lignicola* (Peck) Jacobsson
 - Štirovača; old sawdust beside a forest of *P. abies*, *A. alba*, *F. sylvatica*: 23 June 2004, exs. 1/3407, 1/3408, 1/3409;
- *Kuehneromyces mutabilis* (Schaeff. : Fr.) Singer et A.H. Sm. (9, 43)
 - = *Pholiota mutabilis* (Scop. : Fr.) P. Kumm.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, on rotten stumps, exs. 1/1050, 5/175; 16 Oct. 2003, on stumps; 23 June 2004;
- *Laccaria amethystina* (Huds. →) Cooke (8, 25)
 - = *Laccaria amethystea* (Bull.) Murrill (nom. inval.)
 - Škrbina draga 2; forest of *A. alba*, *P. abies*, *F. sylvatica*: 15 Aug. 2002;
 - Velika Kosa; forest of *F. sylvatica*, *P. abies*: 17 Aug. 2002;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- Laccaria laccata* (Scop. : Fr.) Berk. et Broome var. *pal-lidifolia* (Peck) Peck (8)
 - = *Laccaria affinis* (Singer) Bon
 - = *Laccaria tetraspora* Singer
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53); 16 Oct. 2003;
- *Lacrymaria lacrymabunda* (Bull. : Fr.) Pat. (34, 56)
 - = *Psathyrella velutina* (Pers. : Fr.) Singer
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- *Lactarius albocarneus* Britzelm. (10, 35)
 - = *Lactarius glutinopallens* F.H. Møller et J.E. Lange
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- *Lactarius aurantiacus* (Pers. : Fr.) Gray (35)
 - = *Lactarius mitissimus* (Fr. : Fr.) Fr.
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003, exs. 1/3241;
- Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- Lactarius deterrimus* Gröger (10, 35)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);
 - Velika Kosa; forest of *P. abies*: 17 Aug. 2002;
- Lactarius salmonicolor* R. Heim et Leclair (10, 35)
 - Škrbina draga 2; forest of *A. alba*, *P. abies*, *F. sylvatica*: 15 Aug. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53); 16 Oct. 2002; 16 Oct. 2003;
- Lactarius scrobiculatus* (Scop. : Fr.) Fr.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 12 Aug. 1975, publ. Tortić (53);
- *Lepiota cristata* (Bolton : Fr.) P. Kumm. (14)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- *Lyophyllum connatum* (Schumach. : Fr.) Singer (26, 43)
 - Škrbina draga 1; on the forest road in the forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002, exs. 1/2776;
- *Macrocystidia cucumis* (Pers. : Fr.) Joss. (8)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Marasmiellus perforans* (Hoffm. : Fr.) Antonín, Hal-ling et Noordel. (5)
 - = *Micromphale perforans* (Hoffm. : Fr.) Gray
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- *Marasmius alliaceus* (Jacq. : Fr.) Fr. (4, 5)
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, exs. 1/1046; 16 Oct. 2003, exs. 1/3203; 23 June 2004;
- *Marasmius androsaceus* (L. : Fr.) Fr. (4)
 - = *Setulipes androsaceus* (L. : Fr.) Antonín
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- *Marasmius bulliardii* Quél. (4, 29)
 - = *Marasmius wettsteinii* Sacc. et P. Syd.
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Rossijevo sklonište 1; subalpine elfin forest with; *F. sylvatica*, *P. mugo*, *Salix* sp.: 28 Sept. 2002, on a dead leaf of *F. sylvatica*;

- *Marasmius cohaerens* (Pers. : Fr.) Cooke et Quél. (4)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Mali Lom; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- *Marasmius wynnei* Berk. et Broome (4)
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Melanophyllum haematospermum* (Bull. : Fr.) Kreisel (14, 20)
 - = *Melanophyllum echinatum* (Roth : Fr.) Singer
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on litter;
- *Mycena aurantiomarginata* (Fr. : Fr.) Quél. (41, 47)
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on rotten branches and litter;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003, on litter of *P. abies*, exs. 1/3240;
- *Mycena crocata* (Schrad. : Fr.) P. Kumm. (41)
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002, exs. 1/2691;
- *Mycena epipterygia* (Scop. : Fr.) Gray (41, 47)
 - = *Mycena epipterygioides* A. Pearson
 - = *Mycena pelliculosa* (Fr.) Quél.
 - = *Mycena viscosa* Maire
 - Jukinica; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Škrbina draga 2; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Mycena flavoalba* (Fr.) Quél. (41, 47)
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003, on litter of *P. abies*, exs. 1/3239;
- *Mycena galericulata* (Scop. : Fr.) Gray (41, 47)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on rotten stumps;
- *Mycena haematopus* (Pers. : Fr.) P. Kumm. (41, 47)
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Mycena maculata* P. Karst. (41)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a rotten log and stump; exs. 1/3192, 1/3205;
- *Mycena metata* (Fr. : Fr.) P. Kumm. (41)
 - Gornja Branjevina; small plantation of *P. nigra* beside a forest of *F. sylvatica*: 6 Nov. 2003, on a twig of *P. nigra*, exs. 1/3238;
- *Mycena pelianthina* (Fr. : Fr.) Quél. (41)
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
- *Mycena pura* (Pers. : Fr.) P. Kumm. (41, 47)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003; exs. 1/3190;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002; – forest of *F. sylvatica*: 23 June 2004, on a stump overgrown with moss;
- *Mycena rosella* (Fr. : Fr.) P. Kumm. (41, 43)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003;
- *Mycena viridimarginata* P. Karst. (41, 47)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 23 June 2004, on a rotten log overgrown with moss, exs. 1/3412;
- *Omphalina grossula* (Pers.) Singer (15, 23)
 - = *Gerronema grossulum* (Pers.) Singer
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, exs. 1/1053, 5/178; 16 Oct. 2003, on rotten stumps and wood debris of *P. abies* or/and *A. alba*, exs. 1/3200;
- *Oudemansiella mucida* (Schrad. : Fr.) Höhn. (9, 43)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a twig of *F. sylvatica*;
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Panellus mitis* (Pers. : Fr.) Singer (43, 59)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003, on fallen branches;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on branches of *P. abies* or/and *A. alba*;
 - Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003, on fallen branches;
- *Panellus stipticus* (Bull. : Fr.) P. Karst. (43, 59)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003;
- *Phaeolepiota aurea* (Matt. : Fr.) Maire ex Konrad et Maubl. (43, 55)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002, exs. 1/2775;

- *Pholiota gummosa* (Lasch : Fr.) Singer (9, 38)
 - Štirovača; grassland: 16 Oct. 2003, exs. 1/3193;
- *Pholiota lenta* (Pers. : Fr.) Singer (30, 36)
 - = *Pholiota lubrica* (Pers. : Fr.) Singer
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003, exs. 1/3242;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- *Pholiota squarrosa* (Weigel : Fr.) P. Kumm. (9, 38)
 - Škrbina draga 1; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
- *Pleurocybella porrigens* (Pers. : Fr.) Singer (34, 57)
 - = *Phyllotus porrigens* (Pers. : Fr.) P. Karst.
 - Mali Lom; forest of *F. sylvatica*, *P. abies*, *A. alba*: 28 Sept. 2002;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 26 Sept. 1998, exs. 5/172; Aug. 2002;
- *Pluteus cervinus* (Schaeff.) P. Kumm. (7, 22)
 - = *Pluteus atricapillus* (Batsch) Fayod
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- **Psathyrella fagetophila* Örstadius et Enderle (40)
 - Misappl.: *Psathyrella murcida* (Fr. : Fr.) Kits van Wav. sensu auct. non Fr.
 - Perišinci; forest of *F. sylvatica*: 23 June 2004, on litter, exs. 1/3403;
- *Pseudoclitocybe cyathiformis* (Bull. : Fr.) Singer (43, 59)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- **Psilocybe bohémica* Šebek (9, 16, 17, 31, 32, 52)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003, on litter and twigs;
 - Škrbina draga 1; forest of *F. sylvatica*, *A. alba*, *P. abies*: 28 Sept. 2002, on pieces of bark of *A. alba* or *P. abies*, exs. 1/2777;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on litter and twigs, exs. 1/3194;
- *Rickenella fibula* (Bull. : Fr.) Raitelth. (15, 23)
 - Štirovača; old sawdust overgrown with moss beside a forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- Russula cyanoxantha* (Schaeff.) Fr.
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);
- *Russula nigricans* (Bull. →) Fr. (48, 49)
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003;
- Russula xerampelina* (Schaeff.) Fr. sensu lato
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);
- *Strobilurus esculentus* (Wulfen : Fr.) Singer (9, 43)
 - Mali Kozjak; forest of *P. abies*, *A. alba*, *F. sylvatica*: 6 Nov. 2003, on buried cones of *P. abies*;
- Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 16 Oct. 2003, on a buried cone of *P. abies*;
- Veliki Lubenovac 1; forest of *P. abies* with numerous grassy clearings: 6 Nov. 2003, on buried cones of *P. abies*;
- Veliki Zavižan; forest of *P. abies* and *F. sylvatica*: 23 June 2004, on buried cones of *P. abies*, exs. 1/3410;
- *Tricholoma sulphureum* (Bull. : Fr.) P. Kumm. var. *sulphureum* (29)
 - Veliki Zavižan; forest of *F. sylvatica*, *P. abies*, *A. alba*: 18 Aug. 2002;
- *Tricholoma terreum* (Schaeff. : Fr.) P. Kumm. (9)
 - Gornja Branjevina; a small plantation of *P. nigra* beside a forest of *F. sylvatica*: 6 Nov. 2003;
- *Tricholomopsis decora* (Fr. : Fr.) Singer (12, 43)
 - Škrbina draga 2; forest of *P. abies*, *A. alba*, *F. sylvatica*: 28 Sept. 2002, on rotten wood, exs. 1/2786;
 - Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: on a stump of *P. abies* or *A. alba*, 16 Oct. 2003;
- *Xerula radicata* (Relhan : Fr.) Dörfelt (9, 59)
 - = *Oudemansiella radicata* (Relhan : Fr.) Singer
 - Škrbina draga 1; forest of *F. sylvatica*: 17 Aug. 2002;
 - Škrbina draga 2; forest of *F. sylvatica*: 15 Aug. 2002;

Excluded records

Amanita cf. *umbrinolutes* Secr.

- Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 13 Aug. 1973, publ. Tortić (53);

Note: The author of the record himself doubted his identification.

Amanita vaginata (Bull. : Fr.) Lam. sensu lato

- Štirovača; forest of *P. abies*, *A. alba*, *F. sylvatica*: 22 Aug. 1974, publ. Tortić (53);

Note: The author of the record interpreted this species in very wide sense, including many species of sect. *Vaginatae* (Fr.) Quél.

According to vegetational and climatic characteristics of this area, it can be assumed that this is only a small part of Agaricales species that actually live in Sjeverni Velebit National Park. It is necessary to continue mycological research of this protected part of Croatian nature.

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